Amendments to the Specification

Please amend the paragraph on page 1, lines 7-15 as follows:

The present invention relates to a system and method for the take-off of [[the]] materials using a two-dimensional CAD interface, and more particularly, to a system and method for [[the]] taking[[take]]-off ~~of the~~ material[[s]] details using a two-dimensional CAD interface which automatically ~~takes~~ creates a material take-off list including [[a]] full detail of material and cost information for items stated in a two or three-dimensional design drawing, without [[a]] manual work or transformation, and which provides the taken-off information [[in]] on-line [[by]]resulting from receiving an order for an information provision service for a two-dimensional CAD drawing through a communication network, such as the internet, and automatically ~~executing~~ executes the information about the take-off of the materials, details, and cost management.

Please amend the paragraphs on page 1, lines 21 to page 4, line 12 as follows:

In addition, a person ~~who is charged of~~ managing construction or manufacture is allowed to analyze ~~each~~ information of interest contained in a plurality of design drawings based on ~~the~~ design drawings created by the CAD program over a long period of time. ~~, takes~~ A take-off list including the materials and associated costs can be generated for use as an ~~for each material, and make out a detail~~ estimate sheet ~~for use~~. ~~In other words, in~~ In the prior art, an operator manually enters output measures in a calculator-based program to thus output them, requiring ~~by executing~~ re-analysis of a two-dimensional blueprint drawing.

However, in such a manual ~~working~~ method, the operator must take[[s]] off the material[[s]]and cost information of interest for each part, ~~and then costs for those materials~~ while checking and comparing material information and numerical information for each item stated in a plurality of blueprint drawings. Thus, it takes a lot of time to manually measure and enter the numerical data of each design structure and shape of the drawing. If the operator makes an error due to carelessness during the manual work, ~~there occurs~~ a problem occurs. ~~that~~ As a

result, there are limitations on the objective verification and modification of both design job and construction job.

On the other hand, in prior art, in order to overcome this problem, a method for calculating a numerical value of materials by placing a blueprint drawing on a digitizer, and entering the numerical information of a two-dimensional drawing by typing or in the form of spread sheets [[is]]has been adapted.

In addition, with the development of three-dimensional design and display techniques in recent times, a method for ~~take~~taking-off the material[[s]] information, after transforming an entity of a two-dimensional drawing into a three-dimensional entity by a CAD program, or after completing a three-dimensional entity in a three-dimensional drawing using a three-dimensional CAD program at the beginning, has been developed and adapted.

However, in this prior art method for ~~take~~taking-off [[the]] material[[s]] information, since a bill of materials is taken off based on the information about the design drawing and the detailed take-off sheet, it is difficult for an operator at a construction site, or a process and cost manager to precisely know parts position information actually required. Thus, it is disadvantageous that reprocessing must be carried out in a self-understandable manner. In addition, in the case that a change in design occurs during [[a]] construction work, it is not easy to compare, crosscheck, and modify both design job and construction job.

Resultantly, in the take-off materials method depending on [[the]] manual work of the operator, if the design drawing is updated, ~~another~~ further manual work has to be done because it is difficult to detect, modify, and change a corresponding part. Accordingly, an enormous waste of time and labor is occurred, and there is a possibility of omitting information and losing unity ~~at an artificial~~ during the modifying process.

In addition, in the method for [[the]] ~~take~~taking-off [[the]] material[[s]]data using a three-dimensional design drawing, it is ~~made~~ difficult to implement functions of entering, modifying, and supplementing a three-dimensional entity as dedicated to a three-dimensional CAD from the viewpoint of practical use. For this reason, there are limitations on a user interface for

reproducing a three-dimensional CAD system to an expert's level, and it is very difficult to share related information or combine individual working drawings so that a plurality of operators can perform a job in cooperation with one another.

On the other hand, at present, there is still no system capable of sharing and analyzing CAD information created in initial steps, although there exists an electronic file which is made by handling a design drawing using a CAD program ~~along with the development of computers~~. Therefore, it is made impossible to carry out physical movement between offices, or between teams, thus making mutual assistance and cooperation in design works difficult.

Moreover, at present, a management service method for managing the entire process from design of a drawing to construction and work according to supply of construction materials using a communication network, such as the internet, capable of sending and receiving multimedia information including character and image information in various forms has been suggested. By this method, when an operator directly takes off the material[[s]] and cost information for a design drawing by means of [[a]] manual work, and then delivers its detailed take-off sheet to a server of the management service in the form of e-mail, a constructor, material provider, and service provider appropriate for building specifications for the corresponding design drawing are linked with one another, thus enabling a more efficient construction job.

However, in this prior art management service method, even though the efficiency of the construction is achieved by combining a constructor, material provider, and service provider appropriate for building specifications for the corresponding design drawing via an internet communication network, the operator still must take off a full list of the material[[s]] and cost details for objects stated in the design drawing with [[a]] manual work. Accordingly, it is difficult to improve the workability of the construction and efficiently carry out the construction.

Please amend the paragraphs on page 4, line 20 to page 6, line 17 as follows:

It is another object of the present invention to provide a method for [[the]] ~~take~~taking-off [[of]] the material[[s]] details using a two-dimensional CAD interface which is capable of easily applying a number of code systems for each building and construction project by

comprehensively supporting a material code classification system which can be applied for each of the categories of construction, facilities, and manufacturing for the purpose of standardization.

It is still another object of the present invention to provide a method for [[the]] ~~take~~taking-off [[of the]] material[[s]]details using a two-dimensional CAD interface which is capable of providing a transmission service via a communication network by automatically analyzing and supplementing parts material and shape information, position information, and cost information for use in a bill of materials, detailed take-off sheet, process, and cost management for buildings and structures included in a predetermined design drawing.

To achieve the above objects, there is provided a system for [[the]] ~~take~~taking-off [[of]] the material[[s]]details using a two-dimensional CAD interface in accordance with a first embodiment of the present invention, in a computer terminal having a CAD system for creating a variety of design items for architecture, civil engineering, machinery, and facilities in a CAD drawing, including: a project information containing unit for containing project information including position data, design specifications, and shape data for a variety of design items; a material/cost containing unit for containing material information and cost information for building elements included in a CAD drawing in which a variety of design items for a project are stated; and a bill-of-material take-off processing unit for estimating a full bill of materials and cost for an object by analyzing position information, shape information, and material information for building elements included in the CAD drawing created by the CAD system with reference to the project information of the project information containing unit and the material information and cost information of the material/-cost containing unit.

In addition, there is provided a method for [[the]] ~~take~~taking-off [[of the]] material[[s]]details using a two-dimensional CAD interface in accordance with a second embodiment of the present invention, including the steps of: registering a project for an object to be built, installed, and manufactured; searching for a material code system corresponding to the registered project from code systems contained in a database, and if the material code system does not exist, registering it as a new code system; selecting a material code by classifying the

registered code system into certain types; copying the material code and related data into the registered project; and estimating a bill of materials for a CAD entity using the material code and related data copied according to the project.

In addition, there is provided a method for [[the]] ~~take~~taking-off [[of the]] material[[s]]details using a two-dimensional CAD interface in accordance with a third embodiment of the present invention, including the steps in which: a client's computer creates a CAD drawing according to a predetermined project; the client's computer connects to a web host server via a communication network to thus request an information provision service of building and construction information for the created CAD drawing design and transmit the corresponding design drawing; the web host server receives the design drawing, and take off shape and position information and bill of material, process, and cost information for the building and construction information based on material codes and cost information contained in the database upon receipt of the design drawing; and the web host server creates a detailed estimate sheet for the requested take-off information, and transmits the same to the client's computer having requested a information provision service via the communication network.

Please amend the paragraph on page 6, lines 23-25 as follows:

Fig. 1 is a block diagram illustrating the construction of a system for ~~the take~~taking-off [[of the]] material[[s]]details using a two-dimensional CAD interface in accordance with a first embodiment of the present invention;

Please amend the paragraph on page 8, lines 2-4 as follows:

Fig. 10 is a view illustrating the entire system of a communication network system for realizing a system for ~~the take~~taking-off [[of]] the material[[s]]data using a two-dimensional CAD interface in accordance with a third embodiment of the present invention;

Please amend the paragraph on page 8, lines 8-10 as follows:

Fig. 12 is a flow chart explaining an operation for the method for ~~the take~~taking-off [[of the]] material[[s]]data using a two-dimensional CAD interface in accordance with the third embodiment of the present invention.

Please amend the paragraphs on page 8, line 15 to page 9, line 17 as follows:

That is, Fig. 1 is a block diagram illustrating the construction of a system for ~~the take~~taking-off [[of the]] material[[s]]data using a two-dimensional CAD interface in accordance with a first embodiment of the present invention.

As illustrated in Fig. 1, the system of the present invention includes: a computer body 100 having a two or three-dimensional CAD program for creating a design drawing in a two or three-dimension, and analyzing its two or three-dimensional CAD drawing, thus the take-off of the materials and cost; a keyboard 200 for entering a variable required for creating a two or three-dimensional CAD drawing ~~and the take-off of the materials and cost~~; a position coordinate input device 300 for operating a program menu for creating a two or three-dimensional CAD drawing ~~and the take-off of the materials and cost~~; and a display monitor 400 for visually displaying the process and results of creating a two or three-dimensional CAD drawing and the take-off list of the materials and cost.

The computer body 100 includes: a CAD system 10 having a two or three-dimensional CAD program for creating various design drawings in a two or three-dimension; [[a]] CAD drawing data 20 created by the CAD system 10 to be stored in a storage device, such as a hard disk drive; a design project information database 30 containing various design project information for the CAD drawing; a material/cost database 40 containing material codes, images, take-off formula information, and cost information for materials stated in the design drawing for a predetermined project; and a bill-of-material take-off processing engine 50 for ~~the take~~taking-off [[of the]] material[[s]]data and cost for each part of an object stated in the CAD drawing with reference to the data stored in the design project information database 30 and the material/cost database 40.

The CAD system 10 is provided with a CAD program and CAD library for creating a two or three-dimensional design drawing for various items to be built and manufactured in architecture or civil engineering. The CAD system 10 is a commonly employed CAD program, for example, "AutoCAD version 14" or "AutoCAD 2000", on which a 3rd party program is operated.

Please amend the paragraphs on page 9, line 25 to page 10, line 17 as follows:

In addition, the material/cost database 40 contains individual material codes for all materials for design items for a variety of buildings, engineering structures, facilities, and fixtures, ~~which can be stated in the CAD drawing data 20, composite~~ Composite material codes ~~as a finishing number~~, cost ~~information~~ for each material, images representing the color and texture of materials for each part, and take-off formula information are provided.

Here, in the material/-cost database 40, it is allowed to set [[a]] material code and cost information for [[an]] atypical data existing in the CAD drawing data 20, as well as [[a]] typical data containing the composite material code and cost information set according to a predetermined project.

The bill-of-material take-off processing engine 50 takes off position information for each part and region of a design item included in buildings, engineering structures, machinery, facilities, and fixtures created based on the CAD drawing data 20 with reference to the project information contained in the design project information database 30, extracts shape information by calculating the length, area, height, and volume of a part or region having its position information with reference to code information for line data and surface data contained in the material/cost database 40, and takes off the materials and cost for each [[of]] building element[[s]] of an object which [[are]]is calculated based on its shape information.

Please amend the paragraph on page 11, lines 8-16 as follows:

In the bill-of-material take-off processing engine 50, the shape information processing and supplement block 70 corrects and supplements a room-intersecting line composed of dots

and lines [[for]]representing each room in order to automatically recognize a closed curve surrounding each room in the CAD drawing data 20. When such a room-intersecting reference line is completed, the cross point of the room-intersecting reference line is automatically recognized to thus forms a room-intersecting closed curve with center in the reference point coordinate of the room name code. ~~Here, if it is difficult to create a room intersecting reference line, it~~ It is allowed to enter a closed curve by manually designating the corresponding given point of the room-intersecting line.

Please amend the paragraphs on page 16, lines 9-16 as follows:

Meanwhile, in the bill-of-material extraction and supplement block 90, material information for materials linked with material codes, i.e., a bill of materials and cost are automatically taken-off, and a detailed take-off sheet for the bill of materials and cost is created as shown in Fig. 5.

As illustrated in Fig. 5, the detailed take-off sheet is created for each room having its room name and room code in the corresponding project, and it displays the room shape, planimeter, name, specification, unit and yield, estimation formula, and unit cost for each building element.

Please amend the paragraph on page 16, lines 23 to page 17, line 7 as follows:

Of course, although a prior art system for ~~the take~~taking-off [[of the]] material[[s]] details based on a three-dimensional CAD also has a function of automatically extracting a value, it is wholly different from the system of the present invention in that it has an interface in which a user must enter [[a]] complete information for three-dimensional modeling from the point of view of a two dimension and three dimension. In the system of the present invention, most users can easily access [[to]] the system and enter repetitive information (e.g., a height value) all at once, because they are accustomed to drawing a two-dimensional drawing. This proves that the system of the present invention gains an absolute advantage over a system using [[a]] three-dimensional modeling in its accessibility, usability, compatibility, and working time.

Please amend the paragraph on page 18, line 10-19 as follows:

Meanwhile, each of building elements in the CAD drawing data 20 having a room name and room number code given by the room code entity input block 60 consists of line data, surface data, and portion data. The shape information processing and supplement block 70 of the bill-of-material take-off processing engine 50 ~~taken~~ takes off area data by establishing a code for the surface data included in the drawing information for each room and drawing a polyline of the CAD drawing data 20 in S15. The bill-of-material take-off processing engine 50 takes off data for horizontal lengths and longitudinal lengths by establishing a code for the line data and drawing a polyline in S16, and establishes a code for the portion data for a member included in the area data and the length data in S17.

Please amend the paragraph on page 20, line 7-19 as follows:

Meanwhile, the detailed take-off sheet generated by the bill-of-material extraction and supplement block 90 is outputted as a result screen on the display monitor 400, and it can be printed out by a printer.

Please amend the paragraph on page 23, lines 18-23 as follows:

Meanwhile, in the thusly constructed present invention, although one example for [[the]] ~~take~~taking-off [[of the]] material[[s]] details for building elements of an object stated in the CAD drawing is applied to the category of architecture, the category of public facilities such as roads, harbors, aerodromes, etc., it also can be applied to the category of manufacture of various construction machinery and manufacturing machinery, and the category of product design of appliances and fixtures in the same manner.

Please amend the paragraph on page 26, line 21 to page 27, line 4 as follows:

In addition, the web host server 400 transmits [[a]] CAD drawing or image information containing the drawing received from the plurality of client computers A1 through An in a

transmitted page [[for]]from the web site or in the form of e-mail to the information estimation processing system 420 for the purpose of requesting an information provision service, thereby making the analysis and take-off of the information ~~done~~complete. In addition, the web host server 400 processes a detailed take-off sheet of the information according to the result of the information analysis and take-off information received from the information take-off processing system 420 in the form of data files of e-mails for thereby transmitting the same to the corresponding client computer.

Please amend the paragraphs on page 28, line 18 to page 29, line 1 as follows:

The detail take-off sheet creation block 426 is used for creating a detailed take-off sheet of a bill of materials including quantities, take-off formulas, and costs for each building element and item name with reference to a bill of materials and cost for an object in the CAD drawing taken-off by the bill-of-material take-off block 424.

Meanwhile, in the same drawing, the management computer 430 selects atypical data of which is difficult to automatically [[the]] take-off [[of the]] material[[s]]details by the information take-off processing system 420, takes off an environment for extracting contour lines such as wall lines, and executes an input job for setting a height needed to take-off areas and volumes for a two-dimensional design drawing.

Please amend the paragraph on page 29, lines 8-11 as follows:

Fig. 11 is a view illustrating one example of the implementation of a bill-of-material take-off service for a two-dimensional CAD drawing via a communication network in the form of internet web pages in accordance with the third embodiment of the present invention.

Please amend the abstract on page 42, lines 1-23 as follows:

ABSTRACT ~~OF THE DISCLOSURE~~

~~The present invention provides to a~~ A system and method for [[the]] ~~take~~taking-off [[of]]

~~the~~ material[[s]] details using a two-dimensional CAD interface~~, and more particularly, to a system and method~~ for estimating a bill of materials ~~using a two-dimensional CAD interface which~~ and automatically creating a material take-off list ~~full bill of material and cost information~~ for items ~~stated~~ in a two or three-dimensional design drawing, without [[a]] manual work ~~or transformation.~~ ~~, and which provides the~~ The taken-off list information is provided [[in]] on-line [[by]]upon receiving an order for an information provision service ~~for a two-dimensional CAD drawing~~ through a communication network, such as the internet~~, and automatically executing the information about bill of material estimating, details, and cost management. The system for the take-off of the materials using a two-dimensional CAD interface, in a computer terminal having a~~ The [[CAD]] system ~~for creating a variety of design items~~is applicable, for example, [[for]]in architecture, civil engineering, machinery, and facilities. The system comprises: a project information containing unit for containing project information including position data, design specifications, and shape data for a variety of design items; a material/cost containing unit for containing material information and cost information for building elements included in a CAD drawing ~~in which a variety of design items for a project are stated~~; and a bill-of-material take-off processing unit for creating a material take-off list ~~a full bill of materials~~ and the associated cost ~~for an object by analyzing position information, shape information, and material information for building elements included in the CAD drawing created by the CAD system with reference to the project information of the project information containing unit and the material information and cost information of the material/cost containing unit~~.